

## REMARKS

Applicants have amended claims 6, 9, 11, and 15 and have canceled claims 7-8, 10, 12-13, and 17-28 in this patent application. Applicants are not conceding in this patent application that said claims are not patentable over the art cited by the Examiner, as the present claim amendments and cancellations are only for facilitating expeditious prosecution of the present patent application. Applicants respectfully reserve the right to pursue these and other claims in one or more continuations and/or divisional patent applications.

New claim 30 is similar to claim 1 except that claim 30 recites a material comprising a swelling agent instead of a clay, which is supported in the specification, page 27, lines 12-19 (“A clay is but one member of larger category known as swelling material. Swelling materials are comprised of phyllosilicates such as smectite clays; naturally or synthetic, montmorillonite, saponite, hectorite, vermiculite, beidellite, stevensite, and the like. All of which may be used for producing polymer nanocomposites. Any swelling material that has a solubility parameter satisfying Equations (7) and (8), whether measured or theoretically calculated, and is capable of exfoliation by the methods presented in accordance with the present invention, may be used in the method 60, for producing polymer nanocomposites.”).

New claim 32, which recites a filler comprising carbon nanotubes as being comprised by the material that includes the swelling agent, is supported in the specification, page 27, lines 19-22 (“A filler refers to a group of materials comprising glass fibers, carbon fibers, carbon nanotubes, talc, mica, and the like. Fillers may be used in combination with swelling agents, such as clays, for use in the production of polymer nanocomposites.”).

The Examiner objected to claims 3 and 7-8 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims. Applicants gratefully acknowledge the Examiner's indication of allowable subject matter. Accordingly and noting that claims 7 and 8 each depend from claim 6 which depends from claim 1, Applicants have amended claim 6 such that claim 6 is rewritten in independent form and includes all of the limitations of claims 7 and 8. Therefore, Applicants respectfully maintain that claim 6 is allowable based on the Examiner's indication that claims 7 and 8 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Examiner rejected claim 15 under 35 U.S.C. §112, second paragraph.

The Examiner rejected claims 1, 2, 4, 10 and 14-16 under 35 U.S.C. § 102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly obvious over Mielewski (US 2002/0082331).

The Examiner rejected claims 5-6, 9, 11 and 13 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mielewski (US 2002/0082331) in view of Lee (US 2003/0205832).

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mielewski (US 2002/0082331) in view of Lee (US 2003/0205832) as applied to claims 1, 2, 4, 6, 9-11, 13-16 above, and further in view of Homma (US 2004/0249009).

Applicants respectfully traverse the § 112, § 102 and § 103 rejections with the following arguments.

**35 U.S.C. §112, Second Paragraph**

The Examiner rejected claim 15 under 35 U.S.C. §112, second paragraph, as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner argues: “Claim 15 further defines the layered clay of claim 1 as an aliphatic fluorocarbon,perfluoroalkylpolyether, quarternary ammonium terminated poly(dimethylsiloxane), an alkyl quarternary ammonuim complex, glass fibers, carbon fibers, carbon nanotubes, talc, mica, natural smectite clay, synthetic smectite clay, montmorillonite, saponite, hectorite, vermiculite, beidellite, or stevensite. This is unclear because aliphatic fluorocarbon, perfluoroalkylpolyether, quarternary ammonium terminated poly(dimethylsiloxane), alkyl quarternary ammonuim complex, glass fibers, carbon fibers, and carbon nanotubes are not clays.”

In response, Applicants point out that Applicants have deleted aliphatic fluorocarbon, perfluoroalkylpolyether, quarternary ammonium terminated poly(dimethylsiloxane), alkyl quarternary ammonuim complex, glass fibers, carbon fibers, and carbon nanotubes in claim 15.

Based on the preceding argument, Applicants respectfully request that the rejection of claim 15 under 35 U.S.C. §112, second paragraph be withdrawn.

**35 U.S.C. § 102(b) and 35 U.S.C. § 103(a): Claims 1, 2, 4, 10 and 14-16**

The Examiner rejected claims 1, 2, 4, 10 and 14-16 under 35 U.S.C. § 102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly obvious over Mielewski (US 2002/0082331).

Since claim 10 has been canceled, the rejection of claim 10 under 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a) is moot.

Applicants respectfully contend that claim 1 is not unpatentable over Mielewski, because Mielewski does not teach or suggest each and every feature of claim 1. For example, Mielewski does not teach or suggest the feature: “selecting a clay having a layered structure and a polymer, said selecting satisfying  $|S_p - S_{scf}| > |S_c - S_{scf}|$  and  $|S_c - S_{scf}| \leq 2.0 \text{ (cal/cm}^3)^{0.5}$ ”.

The Examiner argues: “Although Mielewski is silent with respect to the solubility parameters of the components, particularly montmorillonite, the methods and compositions therein are substantially similar to the currently claimed composition (which includes the recited carbon dioxide SCF, PP polymer, and montmorillonite clay), thus it is examiner's position that although it is not specifically recited, the composition in Mielewski would nonetheless inherently meet the requirements for the currently claimed solubility parameters, or alternatively, would obviously have been present in the Mielewski product, absent evidence to the contrary.”

In response, Applicants respectfully contend that the Examiner incorrectly alleges that the Applicants are claiming the combination of carbon dioxide SCF, PP polymer, and montmorillonite clay. There is no originally filed claim or pending claim that recites the combination of carbon dioxide SCF, PP polymer, and montmorillonite clay. Moreover, Applicants' specification does not teach that the combination of carbon dioxide SCF, PP polymer, and montmorillonite clay satisfies  $|S_p - S_{scf}| > |S_c - S_{scf}|$  and  $|S_c - S_{scf}| \leq 2.0 \text{ (cal/cm}^3)^{0.5}$ . In fact, montmorillonite clay does not even appear in the table of FIG. 3 in which many combinations of polymer, SCF, and clay are listed.

The Examiner has not cited any evidence as to what the solubility factor is for montmorillonite clay and therefore has not provided a credible argument that the combination of carbon dioxide SCF, PP polymer, and montmorillonite clay allegedly satisfies

$$|S_p - S_{scf}| > |S_c - S_{scf}| \text{ and } |S_c - S_{scf}| \leq 2.0 (\text{cal/cm}^3)^{0.5}.$$

Based on the preceding arguments, Applicants respectfully maintain that claim 1 is not unpatentable over Mielewski under 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a), and that claim 1 is in condition for allowance. Since claims 2, 4, and 14-16 depend from claim 1, Applicants contend that claims 2, 4, and 14-16 are likewise in condition for allowance.

### **35 U.S.C. § 103(a) Claims 5-6, 9, and 11-13**

#### **Claims 5-6, 9, 11 and 13**

The Examiner rejected claims 5-6, 9, 11 and 13 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mielewski (US 2002/0082331) in view of Lee (US 2003/0205832).

Since claim 13 has been canceled, Applicants respectfully contend that the rejection of claim 13 under 35 U.S.C. § 103(a) is moot.

As explained *supra* under the “Remarks” section, claims 7 and 8 each depend from claim 6 which depends from claim 1, and Applicants have amended claim 6 such that claim 6 is rewritten in independent form and includes all of the limitations of claims 7 and 8. Therefore, Applicants respectfully maintain that claim 6 is allowable based on the Examiner’s indication that claims 7 and 8 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Since claims 5, 9, and 11 depend from claim 1, which Applicants have argued *supra* to not be unpatentable over Mielewski under 35 U.S.C. § 102(b) or 35 U.S.C. § 103(a), Applicants maintain that claims 5, 9, and 11 are likewise not unpatentable over Mielewski in view of Lee under 35 U.S.C. §103(a).

#### **Claim 12**

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Mielewski (US 2002/0082331) in view of Lee (US 2003/0205832) as applied to claims 1, 2, 4, 6, 9-11, 13-16 above, and further in view of Homma (US 2004/0249009).

Since claim 12 has been canceled, Applicants respectfully contend that the rejection of claim 12 under 35 U.S.C. § 103(a) is moot.

### CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 19-513.

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